WHAT IS CLAIMED IS:

1. An apparatus for metal purification comprising a vessel for creating a vacuum atmosphere, a feed heating zone with an open top that contains a feed crucible to be charged with a feed metal, a condensation zone on top of said feed heating zone in which condensation vapor passage plates that are each convex downwardly and provided with a vapor passage hole in a generally central area and condensation vapor passage plates that are each convex upwardly and provided with a plurality of vapor passage holes in the non-central area alternate with each other at given spacings and are stacked in general symmetry with respect to a plane, and a solidification zone on top of said condensation zone for solidifying said metal.

2. An apparatus for metal purification comprising a vessel for creating a vacuum atmosphere, a feed heating zone with an open top that contains a feed crucible to be charged with a feed metal to generate the vapor of said metal, a condensation zone with an open top and an open bottom communicating with the top of said feed heating zone and in which a plurality of condensation vapor passage plates that form a condensation passageway for vapors in which said vapor is allowed to pass upwardly only through the vapor passage holes made in said condensation vapor passage plates are stacked vertically at given spacings, and a solidification zone with an open top and an open bottom communicating with the top of said condensation zone and which contains a solidification crucible which is cooled externally so that said metal of high purity is solidified from said vapor after it has passed through said condensation zone, said plurality of condensation vapor passage plates being such that condensation vapor passage plates in the form of an inverted cone or dome which are each convex downwardly and provided with a vapor passage hole in a generally central area and condensation vapor passage plates in a conical or dome shape that are each convex upwardly and provided with a

plurality of vapor passage holes in a non-central area, alternate with each other and are stacked in general symmetry with respect to a plane, and a heater for heating said feed heating zone and said condensation zone being provided within or outside said vessel.

3. The apparatus according to claim 2, in which said vessel for creating a vacuum atmosphere further contains an entrapment/solidification zone with an open top and an open bottom communicating with the top of said solidification zone and in which a plurality of entrapment/solidification vapor passage plates that form an entrapment/solidification passageway for vapors which are cooled externally and which said vapor after passing through said condensation zone is allowed to pass upwardly only through the vapor passage holes made in said entrapment/solidification vapor passage plates, thereby solidifying said vapor, are stacked vertically at given spacings, **said plurality of entrapment/solidification vapor passage plates being such that entrapment/solidification vapor passage plates in the form of an inverted cone or dome which are each convex downwardly and provided with a plurality of vapor passage hole in the non-central area and entrapment/solidification vapor passage plates in a conical or dome shape that are each convex upwardly and provided with a vapor passage hole in a generally central area alternate with each other and are stacked in general symmetry with respect to a plane.**

4. The apparatus according to claim 3, wherein a flange is provided on the periphery of each condensation vapor passage plate.

5. The apparatus according to claim 4, wherein the flange is inclined by an angle not greater than one degree with an inner surface of a tubular housing defining the condensation zone.

6. The apparatus according to claim 5, wherein the bottommost condensation vapor passage plate is positioned at least 30 mm above a liquid level of molten metal in the feed crucible.

7. The apparatus according to claim 3, wherein a plurality of the vapor passage holes are in the non-central area of the condensation vapor passage plates.

8. The apparatus according to claim 7, wherein said plurality of holes are off-centered.

9. The apparatus according to claim 7, wherein there are no more than ten holes.

10. The apparatus according to claim 9, wherein the holes are substantially equally spaced from each other.

11. The apparatus according to claim 3, wherein the feed crucible, the solidification crucible and the condensation vapor plates are made of carbon.

12. The apparatus according to claim 3, wherein the feed crucible, the solidification crucible and the condensation vapor plates are made of graphite.

13. The apparatus according to claim 3, wherein a single cylindrical shaped vessel is utilized as both the feed crucible and the solidification crucible.